

## TORREYA

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BOTANICAL  
GARDENNOTES ON THE VARIABILITY OF HYPOTHELE  
REPANDA

BY HOWARD J. BANKER

The species under discussion, *Hypothele repanda* (L.) Paulet, has been more generally known as *Hydnum repandum* L. The plant is easily recognized, being a fleshy mushroom- or toadstool-like plant, but with the underside of the cap formed into fine teeth or prickles instead of with plate-like gills as is the usual case in mushrooms. The color varies from nearly white through cream and buff to reddish buff. The flesh is white and brittle. The taste is mealy, at first mild, but soon producing a tingling sensation in the back of the throat. The spores are white, subglobose to ovoid, usually apiculate, smooth, and with from one to several small, highly refractive spots, or guttulae; these often appear like small warts, but are evidently inside instead of outside of the spore-membrane, though often associated with small protuberances or with pits in the spore-wall. The plant grows on the ground in mixed woods, usually where it is damp. It is fairly common and is widely distributed both in Europe and America. Besides its cosmopolitan character, it appears to be a species of large range of variability. In fact, so great a degree of variation does it exhibit that several attempts have been made to split it into distinct species, but as yet without very great success.

The first of these attempts was made in 1774 by Jacob C. Schaeffer in his *Icones Fungorum*, in which he divided the original species into two based on color, namely, *Hydnum rufescens* (op.

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*cit.* 4: 95. *pl.* 141) and *H. flavidum* (*op. cit.* 4: 99. *pl.* 318). This distinction did not meet with the approval of the European mycologists and was soon forgotten. It could not be expected that a specific distinction could be maintained simply on a shade of color. Nevertheless, with more refined means of discrimination it is possible that Schaeffer's species may yet be established on more solid foundations. In 1799 Persoon\* attempted to separate a species which he unfortunately called *rufescens*, a name, as we have seen, preoccupied by Schaeffer. This species was established on better characters than that of Schaeffer and has persistently perplexed systematists with its claims to recognition. It has repeatedly been treated as a species or as a variety, or has been reduced to synonymy, by different European botanists, and even the same author has frequently shown his perplexity in the varying treatment he has given it in different editions of his works. It is to be noted, however, that European authors agree in ascribing to *H. rufescens* Pers. not only a darker, more reddish color, but a thinner habit and smaller size than to the typical *H. repandum* L. In this respect the European plants stand somewhat in contrast with the American forms, for with us the larger, more stockily built plant is dark reddish buff, while the smaller, thinner plant is pale buff. † There is with us a still smaller plant not exceeding 4 cm. in width of pileus which is reddish buff in color, but it is doubtful if this is the same as the European plant referred to *H. rufescens* Pers. While there is thus some difficulty in fully identifying the American plants with their European congeners we find that they are involved in the same perplexing variability that seems to baffle all attempts to distinguish distinct species.

The following synopsis may assist in some degree in separating the principal forms peculiar to this country and is offered as an aid to a better knowledge of this difficult segregation.

Plant reddish buff.

Plant small, less than 4 cm. wide, often umbilicate; spores large, 8-10  $\mu$  wide.

Form *a.*

Plant large, stout, reaching 12 cm. wide, average width of cap 6-8 cm.; pileus often cracked, sometimes into thick scales, deeply umbilicate; spores 7-8  $\mu$  wide.

Form  *$\beta$ .*

\* *Obs. Myc.* 2: 95.

Plant pale buff to cream-color, slender, medium size, average 4-6 cm. wide, rarely 7 cm.; spores 7-8  $\mu$  wide. Form  $\gamma$ .\*

In all these forms none of the characters ascribed appear to be constant and intermediate forms are easily found, yet in a general way the three forms are readily distinguished in the field by one familiar with the habit of the plant; but herbarium specimens undergo so great changes in drying that it is very difficult to separate these forms with any degree of satisfaction.

Form *a* is the plant described as *Hydnum umbilicatum* by C. H. Peck, Bull. N. Y. State Mus. 10: 953. *pl. K. f. 14-18*. Peck especially emphasizes the umbilicate feature of the pileus, but aside from this character the plant does not appear to be essentially different from those forms which he has usually referred to *rufescens*. On this point compare Peck, Rep. N. Y. State Mus. 48: *pl. 38. f. 7-10*. It is to be observed that in the plate cited, which shows both *repandum* and *rufescens*, the latter is represented with larger spores than the former and that actual measurement of the plate on the scale of 1:400 gives as values for the spores in the case of *repandum* 7-8  $\mu$  and for the variety *rufescens* 8.5-10  $\mu$ . Peck gives for his species *umbilicatum*, *loc. cit.*, spore-values equivalent to 7.5-10  $\mu$ , and in the accompanying plate they are represented of corresponding size. As the umbilicus hardly seems a sufficient ground upon which to establish a species I should regard all the forms in the plates cited as belonging to one segregation, which must be known as the species or variety *umbilicata*; for even if its should be identified with *H. rufescens* Pers. the latter name, as we have seen, is pre-occupied by *H. rufescens* Schaef. which appears to be a distinctly different thing. Specimens referable to this form have been observed in the following collections: Massachusetts, *Forster*; New Jersey, *Ellis*; Carolina or Pennsylvania, *Schweinitz*.† It is very probable that this segregation should be regarded as a distinct species.

\* It has not seemed best to the writer to treat these as varieties, much less as species, in the present paper. The above device has therefore been resorted to, until their claims to distinction can be more clearly established. †

† The specimen observed in the Schweinitz herbarium in the Acad. Sci. Phila. was marked "*Hydnum rufescens* — Schaeffer, Carolina, Pa." The specimen answered remarkably to Peck's description and plate of *H. umbilicatum*.

The three forms considered above do not by any means exhaust the possibilities of variation in this species. A form has been found in Connecticut by Underwood in which the teeth in the dried specimen were subtranslucent, yellowish rufescent, compressed at base, narrowing abruptly into a terete upper portion with ciliate lighter tips. This remarkable plant would be considered as sufficiently marked to form the basis of a new species but for the fact that only one specimen has been seen and that studied only in the dry state.

*Hypothele repanda* is sometimes reported as having teeth somewhat flattened or even fimbriate. This is not the usual character and may indicate a tendency under certain conditions to vary in a definite direction. Sowerby, Eng. Fung. *pl.* 176, figures a plant of this type. Earle reports a plant marked by this feature as found in a sphagnum swamp, Auburn, Alabama, the teeth being 1 mm. wide and 2-4 mm. long in the dried specimen. In his field-notes on this specimen Prof. Earle says, "Reaching 6 cm., the largest specimen I have seen of this flesh-colored *Hydnum*," which would indicate that the southern forms of *H. repanda* are small. Several years ago the writer found a small specimen of this type and not having then seen *H. repanda* the plant was referred to *Sistotrema*. It seems very probable that such a mistake has occurred in the case of other collectors. In fact, the question may reasonably be raised if the genus *Sistotrema* has not itself been established on some such variable type. In 1902 the writer found, at Schaghticoke, N. Y., a group of these plants showing a remarkable development of the flattened teeth. On a wooded hillside of sand loam and in comparatively wet ground was a bunch of three plants. The first was 7.5 cm. high; pileus 7.5 cm. wide, irregular, subinfundibuliform, the surface cracked and broken up more or less into thick scales, buff-colored; stem 5 cm. long, 7 mm. thick, somewhat bulbous at base, cream-colored; teeth close-set, flattened, often 2-4 mm. wide, a few normal terete teeth scattered among them, the upper edge of the flat teeth sometimes cut-toothed. The flattening of the teeth did not appear to be in any definite direction. The other two plants were similar but smaller and had relatively more normal

teeth. Ten feet farther up the hill and where the ground was less wet was another cluster of plants resembling the latter in size and general features but with only a few flattened teeth, one having not more than a dozen, while near the top of the slope and on drier ground were a number of plants showing no flattened teeth whatever. The conclusion would appear to be that growth in wet ground tends to develop flattened teeth. Aside from the flattened character of the teeth these plants would be referred to form  $\beta$ , which I have never observed growing in very wet places. Form  $\gamma$ , however, has been observed always in wet springy places and shows no tendency to the flattening of the teeth.

The various forms of *H. repanda* have been thus fully discussed in order to point out the great variability of this species and to emphasize the need as well as the opportunity for thorough field-work on the forms, habitat, and distribution of this common yet little understood plant.

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## THE BOTANICAL MEETING AT McCALL'S FERRY, PENNSYLVANIA

BY GEORGE V. NASH

As announced in the June number of this journal, the joint meeting of the Torrey Botanical Club and the Philadelphia Botanical Club took place at McCall's Ferry, the week of July 2-9. The meeting proved to be a most enjoyable affair, and much of this enjoyment was the result of the care and endeavor on the part of the members of the Philadelphia club, several of whom acted as guides and led us to the haunts of rare and interesting plants. Certainly the event was a memorable one. Friends and members of other botanical societies accepted the joint invitation of the two clubs, and added much to the pleasure of the meeting by their presence.

Headquarters were established at the hotel on the York county